

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-189191

(43)Date of publication of application : 30.07.1993

(51)Int.Cl.

G06F 3/147
G06F 3/033
G09G 3/18
G09G 3/20

(21)Application number : 04-004933

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(22)Date of filing :

14.01.1992

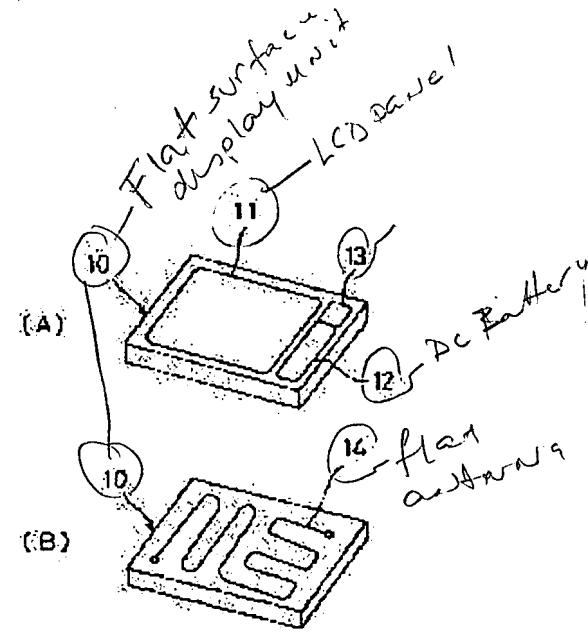
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(54) PLANAR DISPLAY DEVICE

(57)Abstract:

PURPOSE: To realize the high portability of the display device for displaying outputs from the main body of a computer and to freely change the direction of the screen.

CONSTITUTION: Concerning a planar display device 10, the screen of a liquid crystal display panel 11 with touch panel is provided on the front side, and a planar antenna 14 is printed and formed on the rear side. A transmitter/ receiver 12 for executing wireless communication with the main body of the computer and a battery 13 for driving both of the liquid crystal display panel 11 and the transmitter/receiver 12 are built in. In the case of transmitting input data from the touch panel, the transmitter/receiver 12 transmits the input data by adding peculiar set address information to the input data or at a peculiar set carrier frequency.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of

rejection]

[Kind of final disposal of application other than
the examiner's decision of rejection or
application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's
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CLAIMS

[Claim(s)]

[Claim 1] The flat-surface display unit which the body of a computer is another object, and is a flat-surface display unit in which the wireless communication between these bodies of a computer is possible, and was equipped with the structure where of the dc-battery for driving a liquid crystal display panel, and said receiver and the liquid crystal display panel for displaying the signal which the flat antenna for communication between the bodies of a computer, the receiver for receiving the signal from the body of a computer through said flat antenna, and said receiver received was built into one.

[Claim 2] It is the flat-surface display unit which has the structure where said flat antenna was formed in the tooth back of said liquid crystal display panel of printing in the flat-surface display unit according to claim 1.

[Claim 3] It is the flat-surface display unit with which said dc-battery was equipped with the function to also drive said touch panel and transmitter, by having the structure where the touch panel for the data input arranged on the screen of said liquid crystal display panel and the transmitter for transmitting the input data from said touch panel as a signal to the body of a computer through said flat antenna were further built into one in the flat-surface display unit according to claim 1 or 2.

[Claim 4] It is the flat-surface display unit equipped with the function to transmit the data with which this address information was added after adding the address information of the proper to which said transmitter was set in the flat-surface display unit according to claim 3 to the input data from said touch panel as a signal to the body of a computer.

[Claim 5] It is the flat-surface display unit equipped with the function to transmit the input data from said touch panel with the carrier frequency of the proper to which said transmitter was set in the flat-surface display unit according to claim 3.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention relates to the display unit of the flat-surface mold in which the wireless communication between the bodies of a computer is possible.

[0002]

[Description of the Prior Art] In recent years, a miniaturization and low-pricing progress every year, and a computer is becoming one set of an one-person time. As for the display for displaying the output of the body of a computer in it, what used the cathode-ray tube from fields, such as colorization, a price, and display quality, i.e., a CRT display, is in use.

[0003] Drawing 2 is the perspective view showing the example of a configuration of the conventional computer system which used the CRT display. In this drawing, the CRT display of the source-power-supply drive used for 23 by 21 on an exclusive base or a desk, placing the body of a computer and 22 on the keyboard for a data input, and placing and 24 are interconnection cables with 3-5 core wires for the connection between the body 21 of a computer, and CRT display 23.

[0004] On the other hand, in the portable mold personal computer (notebook computer) of note size, the display united with the body of a computer is used. Generally as a device which constitutes this indicating equipment, the liquid crystal display panel and plasma display panel which are driven with a dc-battery are used.

[0005]

[Problem(s) to be Solved by the Invention] The high thing of portability which can be made to place and display on a desk for example by the way, and is immediately settled as an indicating equipment for displaying the output of the body of a computer when [unnecessary] it is the need is desirable.

Furthermore, the display whose screen display is possible in the location of arbitration is desirable.

Moreover, the sense of a screen is wanted to be changed freely so that a user can see a screen with an easy posture. Since it is necessary to change the sense of a screen frequently especially to arrange face to face, while two or more men look at a screen respectively, a degree of freedom high about the modification is required.

[0006] However, since CRT display 23 shown in drawing 2 had large configuration and weight, it was what serves as a deferment mold always used, placing on an exclusive base or a desk, and cannot change the sense of a screen easily. And in order to carry, there was inconvenience that the interconnection cable 24 between the bodies 21 of a computer had to be removed. Furthermore, since power consumption was large, the dc-battery drive was impossible and the source power supply was needed, the usable location was restricted. Moreover, there was also a problem which radiation (spurious radiation) of the unnecessary electromagnetic wave from a keyboard 22 or an interconnection cable 24 produces while in use.

[0007] On the other hand, since the drive by the dc-battery built in the body of a computer is possible for the indicating equipment united with the body of a computer in a notebook computer, compared with CRT display 23, high portability and the high degree of freedom about the sense of a screen are

realizable. However, since this display is united with the body of a computer, even if the display itself is a small light weight very much, the configuration and weight of the whole notebook computer will become to some extent large. Moreover, even if the display itself is a low power, the power consumption of the whole notebook computer will become to some extent large. Therefore, it could not realize but the long duration actuation by the dc-battery had the case where it could not but depend on a source power supply too. The display of the above thing to a notebook computer was not what it can fully be satisfied with both sides of portability and the degree of freedom of the sense of a screen of. When especially the body of a computer had moving part, such as a hard disk and a floppy disk, since vibration could not be given during disk accessing, it was that whose carrying is impossible. Moreover, since the function was deleted in part or memory space was reduced in the body of a computer in order to think portability and a low power as important in a notebook computer, there was also inconvenience, like there is application which cannot be performed.

[0008] The purpose of this invention is to realize the display it can fully be satisfied with both sides of portability and the degree of freedom of the sense of a screen of a display.

[0009]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the body of a computer is another object, and this invention constitutes the flat-surface display unit in which the wireless communication between these bodies of a computer is possible focusing on the liquid crystal display panel of a dc-battery drive.

[0010] If it explains concretely, invention of claim 1 will adopt the structure where the dc-battery for driving a liquid crystal display panel, and said receiver and liquid crystal display panel for displaying the signal which the flat antenna for communication between the bodies of a computer, the receiver for receiving the signal from the body of a computer through this flat antenna, and this receiver received was built into one.

[0011] In invention of claim 2, said flat antenna decided to have the structure formed in the tooth back of said liquid crystal display panel of printing.

[0012] Moreover, in order that invention of claim 3 may also enable data transmission on the body of a computer The touch panel for the data input arranged on the screen of said liquid crystal display panel, The configuration equipped with the structure where the transmitter for transmitting the input data from this touch panel as a signal to the body of a computer through said flat antenna was further built into one is adopted. Suppose said dc-battery that it has the function to also drive said touch panel and transmitter.

[0013] In invention of claim 4, it was presupposed to said transmitter that it has the function to transmit the data with which this address information was added after adding the address information of the proper set up for every flat-surface display unit to the input data from said touch panel as a signal to the body of a computer so that the body of a computer could identify the transmit data from two or more sets of flat-surface display units.

[0014] In invention of claim 5, it was presupposed to said transmitter that it has the function to transmit the input data from said touch panel with the carrier frequency of the proper set up for every flat-surface display unit so that the body of a computer could identify the transmit data from two or more sets of flat-surface display units similarly.

[0015]

[Function] According to invention of claim 1, the signal from the body of a computer which is another object is received by a flat antenna and the receiver by wireless, and the this received signal is displayed on a liquid crystal display panel. And since the small liquid crystal display panel of especially power consumption is adopted and the receiver of a low power can also be easily realized also in the display device of a flat-surface mold, capacity of the dc-battery for driving both can be made very small, and prolonged actuation is possible also with the dc-battery of small capacity. Therefore, the formation of small lightweight of a flat antenna, a receiver, a liquid crystal display panel, and a dc-battery is possible, and the whole flat-surface display unit can be formed into small lightweight. That is, the flat-surface display unit concerning invention of claim 1 is usable also in the location which could carry freely and

easily anywhere and is considerably distant from the body of a computer. Moreover, any constraint does not have the sense of the screen of a liquid crystal display panel, and it is changed freely.

[0016] Furthermore, since the wireless communication between the bodies of a computer is adopted, in the case of the conventional CRT display, it is different, and it does not produce the problem of the spurious radiation from an interconnection cable. Moreover, since the flat-surface display unit for displaying the output of the body of a computer and this body of a computer is used as another object, only a flat-surface display unit can be carried working, without being different in the case of said notebook computer, and giving vibration to the body of a computer. On the other hand, since the body of a computer can be used for example, as a deferment mold, the body of a computer can be made to be equipped with the sufficient function and the memory space corresponding to application.

[0017] Especially according to invention of claim 2, since a flat antenna is formed in the tooth back of a liquid crystal display panel of application of a printing technique, a flat-surface display unit is formed into a thin form.

[0018] Moreover, if the touch panel arranged on the screen of a liquid crystal display panel is touched according to invention of claim 3, the data according to the touched coordinate of a location will be transmitted to the body of a computer by the transmitter of a dc-battery drive. Thereby, the bidirectional communication link between a flat-surface display unit and the body of a computer is attained.

[0019] Furthermore, according to claim 4 or invention of 5, even when input data is respectively transmitted to the body of one computer from two or more sets of flat-surface display units, it can identify the transmit data from which flat-surface display unit the body of a computer is based on the address information or the carrier frequency of a proper set up for every flat-surface display unit. Thereby, the body of a computer can receive only the transmit data from a specific flat-surface display unit.

[0020]

[Example] Hereafter, one example of this invention is explained, referring to a drawing.

[0021] Drawing 1 is the perspective view of the flat-surface display unit concerning the example of this invention, (A) shows the transverse-plane side and (B) shows the tooth-back side, respectively.

[0022] The screen of the liquid crystal display panel 11 with a touch panel which has the function of an entry of data and a display is arranged at the transverse-plane side of the flat-surface display unit 10 of this example. Moreover, the transmitter-receiver 12 for the wireless communication between the non-illustrated bodies of a computer and the dc-battery 13 for driving both liquid crystal display panel 11 with a touch panel and transmitter-receiver 12 are built in. The flat antenna 14 connected internally by the transmitter-receiver 12 is formed in the tooth back of the flat-surface display unit 10 of printing. As for this flat antenna 14, it is desirable that it is indirectly.

[0023] The signal sent by wireless from the body of a computer is supplied to a transmitter-receiver 12 through a flat antenna 14, after getting over with this transmitter-receiver 12, it is given to the liquid crystal display-panel part of the liquid crystal display panels 11 with a touch panel, and it is displayed on the screen.

[0024] Moreover, if the touch panel part of the liquid crystal display panels 11 with a touch panel is touched, wireless transmission of the data according to the touched coordinate of a location will be carried out through a flat antenna 14 to the body of a computer by the transmitter-receiver 12. Under the present circumstances, a transmitter-receiver 12 is transmitted after modulating the data with which the address information of the proper set up every flat-surface display unit 10 was added to the input data from the touch panel part, and this address information was added as a signal to the body of a computer. Even when input data is respectively transmitted to the body of one computer by this from two or more sets of the flat-surface display units 10, the body of a computer can identify the transmit data from which flat-surface display unit 10 it is based on address information, and can also receive only the transmit data from the specific flat-surface display unit 10. However, the body of a computer can also adopt the configuration which identifies the transmit data from two or more sets of the flat-surface display units 10 based on a carrier frequency by adopting the transmitter-receiver 12 equipped with the function to transmit the input data from a touch panel part with the carrier frequency of the proper set up

every flat-surface display unit 10.

[0025] According to this example, the bidirectional wireless communication between the bodies of a computer is possible as above. And since the small liquid crystal display panel 11 of power consumption is adopted and the transmitter-receiver 12 of a low power can also be realized easily, capacity of the dc-battery 13 for driving both can be made very small, and prolonged actuation is possible also with the dc-battery 13 of small capacity. therefore, small in the flat-surface display unit 10 whole -- and while forming a thin form, it can lightweight-ize. That is, this flat-surface display unit 10 is usable also in the location which could carry freely and easily anywhere and is considerably distant from the body of a computer. Moreover, since any constraint does not have the sense of the screen of the liquid crystal display panel 11 with a touch panel and it is changed freely, a user can see a screen with an always easy posture, and it is suitable when arranging face to face, while two or more men look at a screen respectively.

[0026] Furthermore, since there is no interconnection cable between the bodies of a computer, extension of the flat-surface display unit 10 is easy, and it is also possible to display the same screen respectively on two or more sets of the flat-surface display units 10. Moreover, unlike the case of the conventional CRT display, the problem of the spurious radiation from an interconnection cable is not produced. And since the flat-surface display unit 10 of another object is adopted with the body of a computer, only the flat-surface display unit 10 can be carried working, without giving vibration to the body of a computer unlike the case of said notebook computer. On the other hand, since the body of a computer can be used for example, as a deferment mold, the body of a computer can be made to be equipped with the sufficient function and the memory space corresponding to application.

[0027]

[Effect of the Invention] Since the flat-surface display unit whose body of a computer is another object by adopting the structure which built the flat antenna, the receiver, the liquid crystal display panel, and the dc-battery into one and in which the wireless communication between these bodies of a computer is possible was realized according to invention of claim 1 as explained above, the high portability of the display for displaying the output of the body of a computer and a degree of freedom with the perfect sense of the screen can be attained to coincidence. Moreover, since the interconnection cable for the connection between the bodies of a computer is not needed unlike the case of the conventional CRT display, the problem of the spurious radiation from an interconnection cable is not produced.

[0028] Furthermore, since the flat antenna of the structure formed in the tooth back of a liquid crystal display panel of printing was adopted according to invention of claim 2, -izing of the flat-surface display unit can be carried out [a thin form], and a cellular phone becomes easy.

[0029] Moreover, since the structure which built the touch panel and the transmitter into one further was adopted according to invention of claim 3, the two-way communication between the bodies of a computer is realizable. And compared with the case where the conventional keyboard is used by adoption of a touch panel, the cure against spurious radiation becomes easy and becomes advantageous also in cost.

[0030] Furthermore, since it was made to perform discernment between the transmit data from two or more sets of flat-surface display units based on the address information or the carrier frequency of a proper set up for every flat-surface display unit according to claim 4 or invention of 5, the body of a computer can receive only the transmit data from a specific flat-surface display unit, for example, becomes convenient for an interactive questionnaire.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view of the flat-surface display unit concerning the example of this invention, and (A) shows the transverse-plane side and (B) shows the tooth-back side, respectively.

[Drawing 2] It is the perspective view showing the example of a configuration of the conventional computer system.

[Description of Notations]

- 10 Flat-Surface Display Unit
- 11 Liquid Crystal Display Panel with Touch Panel
- 12 Transmitter-receiver
- 13 Dc-battery
- 14 Flat Antenna
- 21 Body of Computer
- 22 Keyboard
- 23 CRT Display
- 24 Interconnection Cable

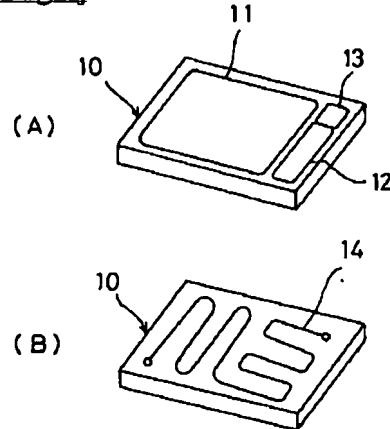
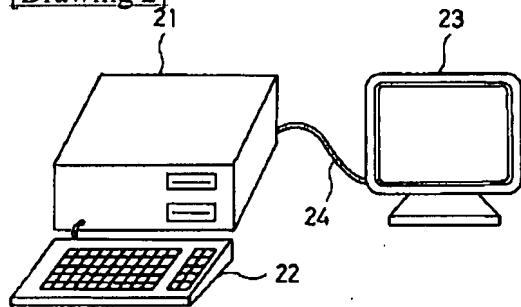
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DRAWINGS

[Drawing 1]**[Drawing 2]**

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